PQSCADA Version 3.2

User Manual 📚

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POSCADA

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Overview

Innovative PQSCADA Enterprise Analysis software enables the operator to view, control, analyze, and monitor multiple measurement devices simultaneously. Data is accurately time-synchronized, within and across, *Sites*





Client application (Elspec Investigator)

Note: This drawing depicts the master modules initiating the communication

The PQSCADA Enterprise System is installed on a personal computer providing unparalleled data monitoring and analysis functionality for all BLACKBOX devices. (For software installation instructions, please refer to **Installing the PQSCADA Software on page 7**).

- PQSCADA Management Studio: The user interface (GUI) that is used to configure the PQSCADA Server as well as check status of the components (For more details, please refer to PQSCADA Management Studio on page 2).
- PQSCADA Server: A windows serviced based application that runs in the background even when you are not logged in. (For more details, please refer to PQSCADA Server on page 3)
- Client Application: Elspec Power Quality Investigator **Refer to the Investigator User Guide.**
- MS SQL Storage: database engine: An SQL Database engine used by the PQSCADA server to store and process the data.

PQSCADA Management Studio

The PQSCADA Management Studio is a Graphic User Interface console used to communicate with the PQS Server. The PQS Server is a windows service.



The PQSCADA installation procedure (Refer to Installing the PQSCADA Software on page 7) allows you to install both the PQSCADA Management Studio (for a detailed explanation, see Management Studio on page 24) and the PQSCADA Server (PQS service). In order to stop and/or start the PQS service, you may use the Graphical User Interface (GUI) as below or by accessing the Services through windows configuration. (Refer to Appendix F: Starting/Stopping PQS through Windows on page 109).

							Start Stop	
	ew Adminis	tration				Microsoftment Star	Pause Resume	
đ+	ex.	*	₫ X			X	Restart All Tasks	,
Add Node	Delete Node	Add Site	Delete Site	Start	Stop	Preferences	Refresh	
	Compo	nents		PQS S	Service	Preferences	Properties	
				212000000000000000000000000000000000000			Help	

PQSCADA Management Studio







Note: This drawing depicts the flow of data

The PQSCADA server is the heart of the BLACKBOX data management and analysis system. The main functionalities of the PQSCADA server are shown in the figure above and further described below with corresponding numbered marks:

Data Collection (Downloading): The PQSCADA server system is responsible for collecting all continuous data (PQZip files) from a connected device automatically. When the device is connected (wired or wirelessly) the PQSCADA server automatically checks for any new data availability using an FTP¹ communication protocol.



3

1

Incoming Data Folder: All new PQZip files found on a connected device are copied (the original files remain on device) to a temporary location on a local hard drive "Incoming data folder".

Data Processing and Storage: The next stage is data processing, in which the data is being organized for storage and quick access (Stage 1) and then a variety of electrical parameters are being calculated (Stage 2) based on the raw PQZip data. The reorganized PQZip data, as well as the calculated parameter statistics are being stored in a local SQL database. The files which have been processed and successfully inserted to the database are then removed from the Incoming folder.

¹ Refer to Integrated FTP Server in the G4500 Operators Manual for more details

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Networking: The PQSCADA server integrates a dedicated HTTP (default port 80) interface that the PQS service listens to on port 80. Management studio and Investigator communicate with the service over that port.

Before Getting Started

Hardware Requirements

To install and run PQSCADA software:

• Verify that the following requirements are met:

			Nun	nber of devices
Minimum	n Requirements	<3	4<20	>20
	Windows XP - sp3	1GB	2GB	
	Windows 2003 - sp2	1GB	2GB	
OS & Memory	Vista - sp1	2GB	2GB	
	Windows 2008	2GB	2GB	Available:
	Vista x64 – sp1	2GB	2GB	
	Windows 2008 x64	2GB	2GB	Consult Elspec Technical Support
Recommended Requireme		ents		Support
Processor		1	2-4	
(# of cores)			2-4	
Disk space		80GB	300GB	

- The recommended disk space for each device is 1GB of temporary disk space and at least 15GB of database disk space for each year of saved data.
- We recommend that each processor be at least 2GHz. Using slower processors might affect performance.
- It is also possible to have the database on a remote server, see further notes about this.
- We recommend a dedicated server for SQL Engine/Databases for large installations (If SQL is installed on the same server as PQSCADA, we recommend a min. of 2 GB of RAM memory).
- Laptops can work fine but since they are usually slower than desktop servers and their disk is usually much slower it is recommended not to install more than 5 devices on the PQSCADA running on a laptop.

Software Requirements

The use of the PQSCADA software requires the following additional application software to be present on your system.

- This PQSCADA version requires INVESTIGATOR ver. 2.3.0.17 and up.
- MSI Installer-Microsoft Windows Installer is an engine for the installation, maintenance, and removal of software on most recent Microsoft Windows systems. (Included with XP SP3 and up).
- .NET Framework 3.5 SP1 A Universal platform developed by Microsoft that provides identical functions for a variety of languages(C#, Visual

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Basic, Java). It is also designed to facilitate development of web applications. (Enable communication between clients and servers)



If you currently do not have these programs installed on your PC, then please refer to Appendix C: Installing Pre-requisites on page 98.

Installing the PQSCADA Software

The following procedure describes a new installation of the PQSCADA software application. For upgrading from a previous version, please refer to **Upgrading the PQSCADA software on page 11.**

To install the PQSCADA software:

1. Navigate to the files on the CD at **Software→PQSCADA** or link at <u>www.elspec.biz/PQSCADA/PQSCADA 3.2.0.33.zip</u>.

The files appear as below.



2. Navigate to the **PQSCADA setup.exe** file, then double click **setup**.

If the .NET Framework 3.5sp1 program is not present on your system, the following message appears. (Refer to Installing .NET Framework 3.5sp1 on page 100)

B PQSCADA	X
	version 3.5. Please install the .NET Framework mework can be obtained from the web. Would
Yes	No

The Welcome screen appears.

PQSCADA	
Welcome to the PQSCADA Setup Wizard	
The installer will guide you through the steps required to install PQSCADA on y	rour computer.
WARNING: This computer program is protected by copyright law and internati Unauthorized duplication or distribution of this program, or any portion of it, may or criminal penalties, and will be prosecuted to the maximum extent possible un	y result in severe civil
Cancel < Back	Next >

3. Click Next.

PQSCADA License Agreement Please take a moment to read the license agreement now. If you accept the terms below, click "I Agree", then "Next". Otherwise click "Cancel". ELSPEC Ltd. PQSCADA End-User Agreement 1. Abstract This is a license agreement between the end-user (End-User) and Elspec Ltd. (ELSPEC) concerning the usage of Elspec PQSCADA SOFTWARE (SOFTWARE) The End user is defined as a who installs conies or ◎ I <u>D</u>o Not Agree I Agree Cancel < <u>B</u>ack <u>N</u>ext >

The License Agreement window appears.

4. Check I Agree, then click Next.

The Select PQSCADA Components screen appears.

岁 PQSCADA		and when we are	
Select PQSCADA Compor	ients		
Select components to be installed			
PQSCADA Server			
PQSCADA Management			
	Cancel	< Back	Next >

5. We recommend selecting both components, then clicking **Next.** (for detailed explanation see **PQSCADA Management Studio on page 2**).

The Select Installation Folder screen appears



6. Make desired selections, then click **Next**.

The confirmation screen appears.

岁 PQSCADA	
Confirm Installation	
The installer is ready to install PQSCADA on your computer.	
Click "Next" to start the installation.	
Cancel < Back	Next >

7. Click **Next** to confirm the installation.

The PQSCDADA Installation commences.

When complete, the Installation Complete window appears.

B PQSCADA	
Installation Complete	
PQSCADA has been successfully installed.	
Click "Close" to exit.	
Please use Windows Update to check for any critical update	s to the .NET Framework.
Cancel	< Back Close

8. Click **Close** to complete the installation.



Upgrading the PQSCADA software

This upgrade is intended for versions 3.1.xx and later. If you have an older version, please refer to **Appendix D: Upgrading from 3.0 on page 102** before proceeding. The upgrade procedure consists of the following:

- Uninstalling the previous PQSCADA Management Studio
- Installing the new PQSCADA Management Studio
- Upgrading the Database
- Re-calculating Parameters (optional)

To upgrade the PQSCADA software:



Uninstall the previous PQSCADA Management Studio

• Select Start→All Programs→Elspec→PQSCADA→Uninstall

Install the New PQSCADA Management Studio

• Install the new version of PQSCADA (please refer to Installing the PQSCADA Software on page 7)

Upgrade the Database

This consists of rebuilding the structure of the database only. In previous versions of PQSCADA, this step also comprised re-calculating the parameters. In this version of PQSCADA, recalculating parameters is an optional step.

To upgrade the database:



1. Click the $\frac{P_{QSCADA}}{Manageme...}$ icon on the desktop

The PQSCADA Management Studio window appears with two *Sites* (Site Name and Site Name 2) from a previous PQSCADA version.



Each *Node* that needs to be upgraded is marked in the device IP column. Also, as the mouse is passed over a *Node* or *Site*, the message in the blue highlighted box appears that an upgrade is required.

2. Right click the *Node* or *Site*.

The dialog box appears:

a g			
Viev	v Administ	ration	
R	R		
Refresh	Nodes/Sites	Tasks	
Refresh	System	Views	
	ponents		Device IP
🖻 🐨 Local Com			
- 👘 Site Na			
- 🐙 PQS N		Upgrade req	
PQS N		Upgrade req	uired
👘 Site Na			
🚽 PQS N		Upgrade req	uired
PQS N	ode4	Unnrade.reg	uired
	U	efresh pgrade elete	

3. Click Upgrade for each *Site* and *Node* individually.

ab			PQSCADA Management Studio 3.2	2.0.11	- = >
Vie	w Administrat	tion			
R	~	\$			
Refresh	Nodes/Sites	Tasks			
Refresh	System ∨	liews			
	nponents	Device IP	Downloading	Data Processing	Database
🖃 🐨 Local Con					
- 👍 Site N		100 100 100 00	Di li l		
PQS N		100.100.100.69	Disabled	Waiting for new data	0.003 / 96.7 GBytes
PQS N		100.100.100.58	Disabled	Waiting for new data	0.003 / 96.7 GBytes
		100.100.100.64	Disabled	Waiting for new data	0.003 / 96.7 GBytes
PQS N		100.100.100.158	Disabled	Waiting for new data	0.003 / 96.7 GBytes
_	Name : PQS Noc Description : PQS	5 Node Description 3929d43f2af14ff5b4527119df49b0c7 1 n : 3.1.4.5			



You may choose to upgrade the Site or Node first. The order of operations is not critical. As each Node is upgraded, the database column indicates the size of the database file in relation to the entire available free disk space.

The blue box indicated in the figure above shows the original database version and the current version of the PQSCADA software.

Recalculating the Parameters

This optional step allows you to recalculate the desired parameters, if needed Since the process of recalculating parameters can take a considerable amount of time (approximately two weeks to calculate one year's worth of data). We recommend that you only perform this procedure if it is necessary.

- You have added a new parameter that needs recalculated in an existing database.
- An existing parameter that has been calculated with a new algorithm that differs from the method used on the previous version.
- In specific cases, refer to the table below. (taken from the Release notes)

Upgrading from Version to Version	Changed/Added Parameters*
3.1.1.0->3.2.0.33	All the parameters in single phase systems Unbalance parameters

	ldc harmonic
3.1.4.5->3.2.0.33	Unbalance parameters
5.1.4.5->5.2.0.55	ldc

* all other parameters will have the same values after recalculation

To recalculate the parameters:



- 1. From the PQSCADA main menu, right click the desired *Node* in the **Data Processing** column.
- 2. Select Recalculate data.

The Recalculate Dates screen appears.

Recalculate Dates	
Start date and time:	1/1/1900 00:00:00 💲
End date and time:	1/1/1900 00:00:00 💲
	Recalculate Close

- 3. Set the desired start and end time.
- 4. Click Recalculate.

PQSCADA Quick Start

This section is intended for the first time user as a **Quick Start** into the most basic critical functions of the PQSCADA Management software. For a complete comprehensive explanation of all PQSCADA components and functions, please refer to **Management Studio on page 24**.

Step 1: Starting PQSCADA Management Studio

To start the PQSCADA Management Studio:



• Click the $\stackrel{PQSCADA}{Manageme...}$ icon on the desktop or select Start \rightarrow All Programs \rightarrow Elspec \rightarrow PQSCADA \rightarrow PQSCADA Management Studio.



The PQSCADA Management Studio window appears.

Y	R	A			
efresh	Nodes/Sites	Tasks			
efresh	System	Views			
	mponents	Device IP	Downloading	Data Processing	Database



The Management Studio opens into the View console as above. There is also an Administration console as described in the

Administration Console on page 26.

Step 2: Adding a New Site

To add a new Site:

2		7	1	A	回	▶ 0	*
Refresh	Locked	Add Node	Delete Node	Add Site	Delete Site	Start Stop	Preferences
Refresh			Components	1		PQS Service	Preferences
Com	ponents		Device IP		Downloading		Data Processing
Local Com	puter	Refresh					
		Copy link					
		Add site					
		Configure	_				

1. Right-click **Local Computer** then select **Add Site** or select **Add Site** under the Administration tab.

The Add Site dialog box appears with an explanation of key terms to follow.

Add site			
his operation will create a	new site		
Database Engine			
Select database engine:	SQL Server	Browser	SQL Express Install
Server Name:			
Usemame:			
Password:			Test
Save Settings			
Database			
 New Database Existing Database 			
Test database connection	1:		Test
Properties			
Name			
			Add Site(s) Cancel

- Select Database Engine: Identifies the database ending as an SQL type server
- Browser button: The browser button allows you to search for an available database server
- Server Name: the name assigned to the server
- User Name: The name of the user as defined for the database server.
- Password: User Defined

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SQL Express Install launches an automatic installation of the SQL server where most parameters are pre-configured. Please refer to Appendix B: SQL Express Install on page 94. We recommend using SQL Express only for evaluation purposes.

2. Click the **Browser** button next to the Server name.

The Select Database Server window appears.

Select Database Server	
Select a database server from the list	
Local Servers Network Servers	
Server Name	
EN-SP1-64BIT\SQLEXPRESS	

- 3. Select **Local Servers** tab. You may access remote databases through the **Network Servers** tab).
- 4. Double click the desired database (We are using an SQLEXPRESS database in our example).

The Add Site window reappears.

dd site		
is operation will create a	i new site	
Database Engine		
Select database engine:	SQL Server 🔹	SQL Express Install
Server Name:	EN-SP1-64BIT\SQLE	
Username:	sa	
Password:	NORM	Test
☑ Save Settings Database		
 New Database Existing Database 		
Test database connectio	n:	Test
Properties		
Name	Site 1	

- 5. Enter your User name (sa) and Password (PQSpqs12345).
- 6. Click **Test** to verify the connection.



- 7. Select Save Settings. (recommend not mandatory)
- 8. Select **New Database** in the database field. (assuming a first time installation)
- 9. Assign a user defined name for the *Site* (may be changed at any time).
- 10. Click Add *Site*(s) when complete.

A successful Site completion window appears.

~	Site added successfully
	100%
	Close

Step 3: Adding a New Node

To add a new Node:

1. Right-click the *Site*, then select **Add** *Node* or Select **Add** *Node* under the **Administration** tab.

View	v Adminis	tration					
2		7	7	d,	Þ	Þe	> >>
Refresh	Locked	Add Node	Delete Node	Add Site	Delete Site	Start Sto	op Preferences
Refresh		1	Components			PQS Servi	ce Preferences
Comp	onents		Device IP		Downloading	31	Data Processing
Local Com	puter	Refresh					
		Add nod Add site					
		Rename Configu					
		Delete					

The Add Node dialog box appears.

his operation will create a	new node	
Database Engine		
Select database engine:	SQL Server *	SQL Express Install
Server Name:	EN-SP1-64BIT\SQLE	
Usemame:	sa	
Password:		
Save Settings		Test
Database		
 New Database Existing Database 		
Test database connection	n:	Test
Properties		Browser
Device IP:		
Name:	1	Thereit

- 2. In the database field, select New Database
- 3. Click the browser button next to **Device IP** in order to attach devices to *Nodes*.

 Select Device

 Select a device from the list...

 IP Address
 Description

 Serial Number

 100.100.100.63
 IP 63

 70 07 B4 F1 08 49

 100.100.100.64
 Tripple IO

 70 07 B4 E7 0E 54

The **automatic** device discovery is activated now and should find all devices on the local LAN if UDP broadcasting is allowed. You may select multiple devices by holding the **Shift key or the Ctrl** key. Each device will be attached to a separate *Node*

4. Double click the selected device(s).

The Device IP and Name appear in the window.

	100.100.100.63	
Name:	Node1	
anic.	nodell	

You may enter the device IP manually or you may enter multiple devices separated by a semi-colon. You may change the Device name at any time. In our example we changed from **IP 63** to *Node* **1**.

5. Click Add Node(s) to complete.

The Add Node Verification window appears.



The **Select Devices** window opens listing all available devices.

Step 4: Starting the Node

Viev	w Administra	ation						
R		A state						
Refresh	Nodes/Sites	Tasks						
Refresh	System	Views						
Co	Components		Device IP Downloading		Data Processin	ig .	Database	
🖃 🐨 Local Con	nputer							
🖕 👍 Site 1								
🖨 🦪 No	ode 1	100.100.10	10.49 🤇	Disabled	>	Waiting for new data		0.003 / 3.4 GBytes
	Node 2		0.65	Disabled		Waiting for new data		0.003 / 3.4 GBytes
No	Node 3		0.62	Disabled The service is disabled.				0.086 / 3.4 GBytes
😑 👍 Site 1/	4				To enable select 'Enable' (on right mouse click menu.		
E PC	QS Site							

To start the Node:

1. From the main PQSCADA Management Studio window, right click **Disabled** in the **Downloading** column.

A drop down menu appears.

Viev	w Administr	ation				
R	R					
Refresh Refresh	Nodes/Sites System	Tasks Views				
Co	mponents		Device IP		Downloading	Da
🕞 🐨 Local Corr 🖕 👘 Site 1	nputer					
🖨 🧬 No	ode 1	100.100.100	100.100.100.49 Disabled			e Y
	Node 2	100.100.100	65	Disabled	Schedule operation	on e
No	Node 3		62	Disabled	IP Setup	e
😑 👘 Site 1/	4				Folders setup	
L. PQS Site					Open in web browse	er
					Open in FTP Open incoming fold	ler
					Enable	

2. Click Enable.

Step 5: Viewing a Node in Investigator

If applicable, you may also verify the *Node's* data by displaying the data in PQSCADA Investigator. You do not have to wait for all the data to finish processing before viewing the *Node*. We recommend using a large time frame (for example **Last Year**) to display the data.



Management Studio

This section provides an in-depth detailed explanation of all PQSCADA functions. The PQSCADA Management Studio application is presented in an itemized format beginning with a look and explanation of the primary viewing screens, then an in-depth description and explanation of all of the functions and components of the software. For a **Quick Reference Guide**, please refer to **PQSCADA Quick Start on page 16**.

The Main User Screen

The PQSCADA user interface screen is comprised of three distinct sections; the **Tool Bar, Status Bar,** and the **Main Viewing Area**. The Tool Bar contains certain specific functional icons (components) specific to the active console. Two different viewing consoles are available; **View** and **Administration**. The main viewing area contains all of the *Sites, Nodes*, **Tasks, and Templates** for the grid.



Tool Bar

The tool bar contains the components that are used to build the infrastructure as well as manage the *Sites* and *Nodes*. The selection of available components is dependent on the viewing console selected. The opening default screen is the *Nodes/Sites* selection in the **View** console.

View Console

The View mode can be used to, both view and modify the *Sites*, *Nodes*, and tasks in the Main Viewing Area. In view mode there are no Component buttons therefore all functions are done by right clicking the component in the viewing area.

- Refresh: To reset the *Sites* and *Nodes* if for some reason connection is lost
- Nodes/Sites: To view all available *Sites* and *Nodes* below in the main viewing area.
- Tasks: The tasks (for more, please refer to Tasks on page 61).

Nodes Sites

This selection allows you to view and modify only the active *Sites* and *Nodes*.



Tasks

This selection allows you to view and modify active Tasks/Templates associated with the *Sites*.



Administration Console

The Administration console provides component buttons that allow editing of PQSCADA components. The layout of the administration console changes according the selected view. The two views are *Nodes/Sites* and **Tasks**.

Nodes/Sites

This selection allows you to view only *Site* and *Node* related component functions in the tool bar.



- Refresh: To reset the *Sites* and *Nodes* if for some reason connection is lost
- Locked: To allow/disallow moving of *Sites/Nodes* by dragging and dropping. (please refer to Hierarchical Site Construction on page 53).
- Add Node: Add a Node(s) to a Site (please refer to Adding a New Node on page 37)
- Delete Node: **Remove a** *Node* **from a** *Site*. (**please refer to** Deleting a Node on page 42)
- Add Site: Add a Site(please refer to Adding a on page 31)
- Delete Site: **Remove a** Site (please refer to Deleting a on page 35)
- PQS Service: To start and stop the PQS Service. (please refer to PQSCADA Management Studio on page 2)
- Preferences: Global user defined settings for the software (please refer to Selecting Preferences on page 29)

Tasks/Templates

This selection allows you to view only Task and Template related component functions in the tool bar.

Vie	w Admin	istration		Select	Tasks from	the View co	nsole first	,
R	R	E.			The window	v below is ac	tive	
Refresh	Nodes/Site:	s Tasks						
Refresh	Syste	em Views						
	e	🔊 View	Admin	istration	•			
		R		to a	-	8	▶ 0	×
		Refresh	Add Task	Delete Task	Add Template	Delete Template	Start Stop	Preferences
		Refresh	Ta	sks	Tem	plates	PQS Service	Preferences

- Refresh: To reset the *Sites* and *Nodes* if for some reason connection is lost
- Add Task: Creates a new task (refer to

2	R	-	
Refresh	Nodes/Sites	Tasks	
Refresh	System	Views	
Co	mponents		Status
Local Co	mputer		
- PQS	Site		
	asks		- 45
		Add ta	Ch1 22



- Adding a Task on page 59)
- Delete Task: Removes a task (refer to Deleting a Task on page 70)
- Add Template: Create a new template (refer to Adding a Template on page 72)
- Delete Template: **Removes a selected template (refer to Deleting a** Template on page 77)
- PQS Service: To start and stop the PQS Service. (refer to PQSCADA Management Studio on page 2)

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• Preferences: Global user defined settings for the software. (refer to Selecting Preferences on page 29)



Only the components that are available are activated above. This depends upon the current status of the selected Site, Node, and/or template.

Selecting Preferences

R			1	Ē.	P		0	×
Refresh	Locked	Add Node	Delete Node	Add Site	Delete Site	Start	Stop	Preferences
Refresh			Components			PQS S	Service	Preferences

In the Administration console, the global **Preferences** for the software are established in this section. The Preferences section is comprised of the following:

- General
- Regional Settings
- Network Settings
- Appearance

To select Preferences:

• From the Administration Console, select Preferences.

The default General default window appears.

General

Preferences	
General	General
Regional Settings	Reset default settings:
Network Settings	
Appearance	Minimize to system tray
	Hide splash screen

• Minimize to system tray: The PQSCADA icon will reside in the bottom system tray when minimized. Double click the icon to restore the window. (default is unchecked)



• Hide splash screen: The opening splash screen does not appear when launching the program. This may be essential in some cases when connected remotely to a computer running the management console. (default is unchecked)



Regional Settings

Preferences		Σ
General	Language	
Regional Settings	Select the language for the application:	
Network Settings		_
Appearance	English (English US)	*
	Time Settings Current Time is: 11:42 GMT 00:00 O User defined time GMT: 00 - : 00 - Image: System time System time System time : 00 - : : 00 -	

- Language: A selection of regional languages.
- Time Settings: Change this setting if you would like to see all dates and time according to a different time zone. The default is System time.

Network Settings

Preferences		X
General Regional Settings	HTTP Port	
Network Settings	PQSCADA Http Port: 80	
Appearance		Test
	Server to Client Communication Type	
	Named Pipe	

- PQSCADA HTTP Port: The software uses Http port 80 as the default port to communicate with the *Node*.
- Server to Client Communication Type: Choose the method of communicating with the server. In a case when HTTP Port 80 is blocked or occupied by another program, use Named Pipe. Default is HTTP.

Appearance

Preferences General	Skin	X
Regional Settings Network Settings	Load skin:	Browse
Appearance	Select skin: ElsSkin	
	Refresh screen Refresh screen every: 1000 millisecond	
	Enable font correction	

• Skin: Not applicable in this version.
- Refresh Screen: How often the screen is refreshed with new data. Lowering this value will result in a faster refresh rate, but will also cause the management studio to use more system resources. The default is: 1000 ms.
- Enable font correction: This allows the software to correct some font issues with certain Operating Systems.

Sites

The *SITE* is a software component (logical representation) of a physical location(s) which represent a group of *Nodes* (devices). The SERVER (Local Computer) is the representation of the physical machine (on which the PQSCADA server application is installed).

The purpose of a *Site* is to organize the *Nodes* by a common set of characteristics (i.e. location). For each monitored device, a *Node* must be created.

Adding a Site

To add a new Site:

2		7	-	A	₩.	Start Stop	S Preferences	
Refresh Refresh	Locked	Add Node	Delete Node Components	Add Site	Delete Site	PQS Service		
Components			Device IP	Downloading			Data Processing	
Local Com	puter	Refresh Copy link						
		Add site						

1. Right-click **Local Computer** then select **Add Site** or select **Add Site** under the Administration tab.



PQSCADA software requires an MS SQL Server Engine version 2005/2008. If you do not have access to an existing SQL Engine (locally or remotely, you can install a free limited version of SQL Server Express from the installation disk. The Add **Site** dialog box appears with an explanation of key components to follow.

Add site		
his operation will cre	ate a new site	
Database Engine		
Select database en	gine: SQL Server Browser	SQL Express Install
Server Name:		
Usemame:		
Password:		Test
Save Settings		
Database		
 New Database Existing Database 	se	
Test database con	ection:	Test
Properties		
Name		

- Select Database Engine: Identifies the database ending as an SQL type server
- Server Name: The name assigned to the server (Elspec default is PQS)
- User Name: The name of the user(Elspec server is pre-defined)
- Password: User Defined
- Browser button: Allows you to search for an available database server



SQL Express Install launches an automatic installation of the SQL server where most parameters are pre-configured. Please refer to Appendix B: SQL Express Install on page 94. We recommend using SQL Express only for evaluation purposes. 2. Click the **Browser** button next to the Server name.

The Select Database Server window appears.

	abase Server se server from the list	
Local Servers	Network Servers	
Server Name	•	*
> EN-SP1-64B	IT\SQLEXPRESS	

- 3. Select **Local Servers** tab. (We recommend putting SQL on the Local Server; however you may access a remote database through the **Network Servers** tab).
- 4. Double click the desired database (We are using an SQLEXPRESS database in our example).
- 5. The Add Site window reappears.

		X
Add site		
This operation will create a	a new site	
Database Engine		
Select database engine:	SQL Server 🔹	SQL Express Install
Server Name:	EN-SP1-64BIT\SQLE	
Username:	sa	
Password:	****	Test
🔽 Save Settings		
Database		
 New Database Existing Database 		
Test database connection	on:	Test
Properties		
Name	Site 1	
		Add Site(s) Cancel

- 6. Enter your User name (sa) and Password (PQSpqs12345).
- 7. Click **Test** to verify the connection.





- 8. Select Save Settings (recommended not mandatory)
- 9. Select New Database in the database field.
- 10. Assign a user defined name for the Site (may be changed at any time).
- 11. Click Add Site(s) when complete.

The Add Site window appears when complete.

_	
~	Site added successfully
	100 %
	Close

Deleting a Site

To delete a Site:

1. From the main window, right click **Site** name (**Site** 1 in our example), then select **Delete** or select **Delete** *Site* under the Administration tab



The Remove Site dialog box appears with all of the Site specifications.

Pressing the 'Remove Site to remove	e Site' button, will remove the Site from the server.
ID: Name:	ELSSITE_93451e94ed2942898f98951ee5fcb340
	 me: EN-SP1-64BIT\PQS
Database name:	ELSSITE_93451e94ed2942898f98951ee5fcb340
📝 Remove databası	e:
Uncheck this check!	box to leave the database as is.
🗹 Delete base folde	r.
Uncheck this check!	box to leave the Site local files as is.

You have the option to leave/remove the database and database folder.

2. Click Remove Site.

Configuring the Site

Configuring the **Site** is simply applying a user defined name and description to an existing *Site*.

To configure the Site:



1. From the view or administrative console, right click the *Site*, then select **Configure**

The Site Configuration window appears.

Name		
Basic Settings		
Name:	Site 2	
Description:		

- 2. Enter a user defined Name and Description.
- 3. Click **Apply** when complete.

Nodes

A *Node* is a logical representation of the physical device location that performs all of the following functions:

- Retrieves and de-compresses the PQZip files
- Parses and stores the data into the correct database.
- Calculates queries in real time.

Adding a New Node

To add a new Node:

Viev	v Adminis	tration					
Refresh	Locked	Add Node	Celete Node	Add Site	Delete Site	Start Sto	p Preferences
Refresh		†	Components			PQS Servic	e Preferences
🖃 🐨 Local Com	puter		Device IP		Downloading		Data Processing
L G Site 1		Refresh					
		Add nod					
		Add site					
		Rename Configu					
		Delete					

1. Right-click the *Site*, then select **Add Node** or Select **Add Node** under the **Administration** tab.

The Add Node dialog box appears.

Add node		
This operation will create a	new node	
Database Engine		
Select database engine:	SQL Server 👻	SQL Express Install
Server Name:	EN-SP1-64BIT\SQLE	
Usemame:	sa	
Password:	****	
Save Settings		Test
Database		
New Database		
C Existing Database		
Test database connectio	n:	Test
Properties		Browser
Device IP:		
Name:		
		Add Node(s) Cancel

- 2. In the database field, select New Database
- 3. Click the browser button next to **Device IP** in order to attach devices to *Nodes*.

A window opens listing all available devices.





The automatic device discovery is activated now and should find all devices on the local LAN if UDP broadcasting is allowed. You may select multiple devices by holding the Shift key or the Ctrl key. Each device will be attached to a separate Node. 4. Double click the selected device.

The **Device IP** and **Name** appear in the window.

Add node		
his operation will create a	a new node	
Database Engine		
Select database engine:	SQL Server *	SQL Express Install
Server Name:	EN-SP1-64BIT\SQLE	
Usemame:	sa	
Password:	*****	
Save Settings		Test
Database		
 New Database Existing Database 		
Test database connection	on:	Test
Properties		
Properties Device IP:	100.100.100.63	
	100.100.100.63 Node 1]	

You may enter the device IP manually or you may enter multiple devices separated by a semi-colon. You may change the Device name at any time. In our example we changed from **IP 63** to *Node* **1**.

5. Click Add Node(s) to complete.

The Add Node Verification window appears.

~	Node(s) added successfully
	100 %
	Close

Start Downloading the Data

After both a *Site* and a *Node* are added, it is recommended to verify the *Node* is functioning. In order to verify *Node* operation, you must first enable the downloading of data. The downloading default is disabled as shown in the figure below:

Viev	v Administra	ation						
R								
Refresh	Nodes/Sites	Tasks						
Refresh	System '	Views						
	Components		Device IP Downloading Data Processing			Database		
E- Con Local Com	puter]						
😑 👍 Site 1								
🖨 🧬 No	de 1	100.100.10)0.49 🤇	Disabled	>	Waiting for new data		0.003 / 3.4 GBytes
	Node 2	100.100.10	0.65	Disabled		Waiting for new data		0.003 / 3.4 GBytes
🚽 🖉 No	de 3	100.100.10	0.62	Disabled	The service is disabled.			0.086 / 3.4 GBytes
🖕 👍 Site 1/	A CONTRACTOR OF A CONTRACTOR A				To enable select 'Enable' (on right mouse click menu.		
E PG	S Site							

To start downloading the data:

1. From the main PQSCADA Management Studio window, right click **Disabled** under the **Downloading** heading.

A drop down menu appears.

Vie Refresh	W Administra	Tasks		
Refresh	System \	/iews		
Components		Device IP	C	Downloading
Local Cor ف- او Site 1 ف- الع		100.100.100.49	Disabled _[
	Node 2	100.100.100.65	Disabled	Schedule operation
	ode 3	100.100.100.62	Disabled	IP Setup
😑 👍 Site 1				Folders setup
- PI	ų5 Site			Open in web browser Open in FTP Open incoming folder
				Enable

2. Click Enable.

The database enabling process commences a two stage process.

Viev	w Administr	ation				
2		A state				
Refresh	Nodes/Sites	Tasks				
Refresh	System	Views				
Cor	Components		Device IP	Downloading	Data Processing	Databas
🗉 🐨 Local Com	puter					
🖨 👍 Site 1						
🖨 🧬 No	ode 1	100.100.10	0.49	Downloading at 270.2 kB/sec	Processing stage 1 of 2	0.020 / 3.4 GBytes
	Node 2	100.100.10	0.65	Disabled	Waiting for new data	0.003 / 3 4 GButes
- 🚛 No	Node 3		0.62	Disabled	Processing file: EF_B500E5_20090625	235802866_9.PQZip
🗐 👘 Site 14	4				File date: 6/26/2009 1:58:02 AM Parsing performance: 18.0 (Sec/Day of	f data)
	(S Site				Estimated time left: 53 Second(s)	(data)

You can see the data downloading status above. As the data is being downloaded, you are able to view, not only the downloading rate, but the file progress as well as below.

Downloading at 270.2 kB/sec

Passing the mouse over the Data Processing heading shows the time remaining as in the window below.

Processing file: EF_B500E5_20090625235802866_9.PQZip File date: 6/26/2009 1:58:02 AM Parsing performance: 18.0 (Sec/Day of data) Estimated time left: 53 Second(s)

Deleting a Node

1. Right-click the *Node* , then select **Delete** or select **Delete Node** under the Administration tab

2			1	ф,	P	Þe) 🕺	
Refresh	Locked	Add Node	Delete Node	Add Site	Delete Site	Start Sto	p Preferences	
Refresh			Components			PQS Servic	e Preferences	
Components		Device IP			Downloading		Data Process	
- Coral Con	iputer							
	ide 1	100 100 100	58	Disable	d	W	/aiting for new data	
		Refresh						
		Rename						
		Configure	B.					
		Delete						

The Remove Node dialog box appears with all Node information.

Pressing the 'Remove N	ode' button, will remove the node from the server.
Node to remove	
ID:	ELSNODE_c9e1abedb6994ebc963d60d6561c1734
lame:	Node 1
Database server name:	EN-SP1-64BIT\PQS
Database name:	ELSNODE_c9e1abedb6994ebc963d60d6561c1734
Remove database:	
Incheck this checkbox	to leave the database as is.
Delete base folder:	
Incheck this checkbox	to leave the node local files as is.

You may choose to leave the database and/or database folder active even though the *Node* is removed, un-checking the boxes.

2. Click **Remove Node**.

Configuring a Node

Each *Node* can be individually configured to collect data from the device according to pre-set parameters and settings. There are the following configurable parameters for *Node* configuration.

- Name
- Device
- Download Schedule
- Data Processing
- Database

Viev	View Administration						
R		A state					
Refresh	Nodes/Sites	Tasks					
Refresh	System	n Views					
Com	oonents						
🖃 🐨 Local Com	puter						
i⊟⊶ 🗗 Site 1							
- 🗬 No		100.100.100.6					
- 🧬 No	de 2 F	Refresh					
No 🛃	- F	Rename					
L. P. No	de 4 (Configure					
	C)elete					

To configure a Node:

From the view or administrative console, right click the *Node*, then select Configure. When complete with each component setting, click
 Apply
 to save changes.

Name

ode Configuration						
lame	Device	Download Schedule				
Name:	Node 4					

- Name: A user defined name for the Node.
- Description: A user defined description for the Node.



- IP address: Enter the IP address of the device or use the search window browser.
- User Name: Each device is shipped with a default user name (Elspec) as above. This name corresponds to the FTP login name set in the firmware of the device (Access Setup section). If you wish to change the user name here, then it also must be changed in the firmware.
- Password: The password corresponds to the user name above. It should be changed according to the device password. (the default password as shown above is elspecelspec).
- Device PQZip folder path: The specific path where the PQZip folders are stored on the device. We do not recommend changing this setting.
- FTP Protocol: The default setting is Passive.

Download Schedule

ame Device		Download Sched	ule	Data Processing		Folders Datab	ase
Periodic time to get file:	600	Seconds					
Download schedule:	🗹 Sun 💽 Thu	💽 Mon	🗹 Tue 🔽 Sat	Ved		2:00 AM 🗘 To 1:59 AM	*
Limit download time range:	🔽 Enable:	1/1/1977 2:00.	AM 🝷 To	0 1/1/1977 2:00 AM	-		
Download order:	Oldest First						

- Periodic time to get file: This is a user defined setting to determine the interval of time to retrieve the PQZip file(s) from the device. If multiple files exist, this setting is not relevant and there will be no delay.
- Download Schedule: The specific days and times to perform the file retrieval.

- Limit download time range: Specifies which files are downloaded that meet a specific date criteria. Enabling this parameter will exclude files that do not fall in the specified time range.
- Download Order: The order in which files are downloaded. The default setting is Oldest First. The Newest First option takes longer on slower networks, therefore we recommend using the default setting on slower networks. If this setting is changed, then you we recommend that you also change the Parsing order under the Data processing tab
- File download mode: This is a factory setting that should not be changed.

Data Processing

Node Configuration							
Name	Device	Download Schedule	Data Processing	Folders			
Parsing order:	Oldest first	•					

• The processing order of PQZip data files into a usable format for Investigator software. We strongly recommend the parsing order be consistent with the file download order.

Folders

_						2			
	Node Configuration								
Ι.	Name De	vice	Download Schedule	Data Processing	Folders	Database			
	Incoming folder size li	imit: 2000	MBytes						
	Backup folder size lim	nit: 🗹 200	MBytes						
	Bad files folder size lin	mit: 200	MBytes						

- Incoming folder size limit: The size of the temporary folder where the PQZip files are stored while they are waiting to be processed. The default is 2 GB, although this can be changes according to your available system resources. All original PQZip files are deleted after they are processed unless they are backed up.
- Backup folder size limit: The size of the backup folder where all good PQZip files can be archived. When the file folder reaches its limit, the oldest files will be deleted first.

• Bad files folder size limit: The size of the bad file folder where all bad PQZip files are kept. A file status (good or bad) is determined when the file is processed.

Database

					[
guration					
Device	Do	vnload Schedule	Data Processing	Folders	Database
te data automatica	ally 🔽				
ze in database:	350) MBytes			
ne in database:	I 90	Days			
		Device Downers	Device Download Schedule te data automatically 🔽 ze in database: 😨 3500 MBytes	Device Download Schedule Data Processing te data automatically 2e in database: 3500 MBytes	Device Download Schedule Data Processing Folders te data automatically Image: Comparison of the second secon

- Allow truncate data automatically: Enabling this feature allows the *Node* to truncate older data once the database size limit is reached.
- Limit data size in database: Enabling this feature limits the amount of data in the database to the specified amount. If this limit is reached and "Auto truncate" is not enabled, then the *Node* won't parse any *Node* files until data is deleted manually.
- Limit data time in database: Enabling this feature limits the amount of data in the database to the specified time duration. If this limit is reached and "Auto truncate" is not enabled, then the *Node* won't parse any *Node* files until data is deleted manually.

Node Status

Vie	w Administr			
R	R			
Refresh	Nodes/Sites	Tasks		
Refresh	System	Views		

The PQSCADA Management Studio is an interactive tool which provides full control and monitoring of all of PQSCADA's activities. The main PQSCADA Management Studio's window is a hierarchical table/grid with following columns:

- Components
- IP Address
- Downloading
- Data Processing
- Database

Components

The PQSCADA suite is designed to operate and manage a virtually unlimited number of BLACKBOX devices, both Portable and fixed. The physical device is represented under the system by the term *Node*.

The *NODE* is the software component which represents data taken by a physical device such as BLACKBOX Portable or a fixed G4k model.

The *SITE* is a software component which represents a group of *Nodes*. The SERVER is the representation of the physical machine (Analysis lab) on which the PQSCADA server application is installed

Status	Description	Right Click Menu
The name	The given name to the Node	 Refresh Rename Configure Delete
"Needs Upgrade"	The <i>Node</i> requires upgrade. Use <i>Upgrade</i> on right mouse click menu.	RefreshUpgradeDelete

IP Address

Z	Description	Right Click Menu
IP Address or host name in hyperlink format	The IP Address is defined.	 Open in Explorer Open in FTP IP Setup
"No IP defined"	No IP Address is defined, Link is disabled.	IP Setup

Downloading

The Downloading field displays the status of the data downloading process. Below are the list of status variations that might be expected in that field.

Status	Description	Right Click Menu
"Disabled" in light gray	The FTP downloading service is disabled.	 Schedule operation IP Setup Folders setup Open incoming folder Enable
"No IP defined" in light gray	IP address not defined. FTP downloading service is disabled.	 Schedule operation IP Setup Folders setup Open incoming folder Enable
<mark>Error: link failure</mark>	No communication IP was set. However, device is not reachable. Check physical connection.	 Refresh Force connection attempt Schedule operation IP Setup Folders setup Open in Explorer Open in FTP Open incoming folder Disable
Error: login failure	No communication IP was set. Login failure Use <i>IP Setup</i> to verify/modify FTP user name and/or password.	 Refresh Force connection attempt Schedule operation IP Setup Folders setup Open in Explorer Open in FTP Open incoming folder Disable

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Status	Description	Right Click Menu
"Next attempt in XX seconds"	Waiting for the next communication attempt	 Refresh Schedule operation IP Setup Folders setup Open in Explorer Open in FTP Open incoming folder Disable
"Checking for new files"	Communication established, Checking for new files	 Refresh Force connection attempt Schedule operation IP Setup Folders setup Open in Explorer Open in FTP Open incoming folder Disable
"XXX kB/sec" in normal color	Downloading new files	 Refresh Force connection attempt Schedule operation IP Setup Folders setup Open in Explorer Open in FTP Open incoming folder Disable
Error: Incoming folder full	PQZip folder is full due to folder limitations. Use Folders Setup to modify the Incoming folder quota or free some disk space.	 Refresh Force connection attempt Schedule operation IP Setup Folders setup Open in Explorer Open in FTP Open incoming folder Disable
<mark>Error: Disk full</mark>	PQZip folder is full due to disk space limitations.	 Refresh Force connection attempt Schedule operation IP Setup Folders setup Open in Explorer Open in FTP Open incoming folder Disable

Status	Description	Right Click Menu
Error: incoming folder not founc	The incoming directory is missing.	 Refresh Force connection attempt Schedule operation IP Setup Folders setup Open in Explorer Open in FTP Open incoming folder Disable
Error: cannot write file	Cannot write the downloaded file to disk	 Refresh Force connection attempt Schedule operation IP Setup Folders setup Open in Explorer Open in FTP Open incoming folder Disable

Data Processing

The Data Processing field displays the status of the PQZip data processing engine. Below are a list of status variations that might be expected in that field.

Status	Description	Right Click Menu
"Disabled" in light gray color	The service is disabled.	 Folders setup Define 'time of interest' interval Configure service Open incoming folder Open 'bad files' folder Open data backup folder Enable
"Processing stage 1 of 2"	Stage 1 (PQZip parsing)	 Refresh Force file parse attempt Folders setup Define 'time of interest' interval Show/ modify data channels configurations Configure service Open incoming folder Open 'bad files' folder Open data backup folder Disable Recalculate data
"Processing stage 2 of 2" in normal colors	Stage 2 (Recalculate summaries)	 Refresh Force file parse attempt Folders setup Define 'time of interest' interval Show/ modify data channels configurations Configure service Open incoming folder Open 'bad files' folder Open data backup folder Disable Recalculate data
Database error	Database is full or unavailable	 Refresh Force file parse attempt Folders setup Define 'time of interest' interval Configure service Open incoming folder Open 'bad files' folder Open data backup folder Disable Recalculate data

Status	Description	Right Click Menu
"Waiting for new data"	ldle, no new data found in Incoming folder	 Refresh Force file parse attempt Folders setup Define 'time of interest' interval Show/ modify data channels configurations Configure service Open incoming folder Open 'bad files' folder Open data backup folder Disable Show last day log Recalculate data
Bad files folder is full	"Bad files" folder is full.	 Refresh Folders setup Define 'time of interest' interval Configure service Open incoming folder Open 'bad files' folder Open data backup folder Disable Show last day log Recalculate data

Database

The Database field displays the status of the *Node*'s database. Below are a list of status variations that might be expected in that field.

Status	Description	Right Click Menu
Login Error	Login Error. The administrative access to the database was denied. Please select Login setup option on right mouse click menu.	• Login setup
Database is full	Database is full. The database size has reached its maximum state. Please resolve that issue on Size limitation setup, free more disk space or truncate unnecessary data.	 Refresh Login setup Size limitation setup
XXX MB / YYY MB	Online	 Refresh Login setup Size limitation setup Backup Restore Delete data Re-index Import data Export data

Hierarchical Site Construction

The PQSCADA software offers a user friendly hierarchical *Site* construction view. A very large *Site* (Clear Energy Company in our example) can be broken down into smaller sub-*Sites* (Green Mountain and Blue Hill Wind Farms). In each *Sub-Site*, it is possible to create *Sub-Nodes* (T1-T6, Service B, and Service G). In this way, the structure and GUI of the Main viewing area in PQSCADA most accurately represent the actual electrical grid architecture.

The PQSCADA Hierarchical *Site* Construction

Components	Device IP
E 🐨 Local Computer	
🖨 👜 Clear Energy	
- 🐨 155 KV	100.100.100.49
🚽 🚽 Blue Hill Wind Farm	100.100.100.65
🚽 🚽 Green Mountain Wind F	arm 100.100.100.117
🖨 付 Blue Hill Site	
	100.100.100.205
- 👉 T2	169.254.249.247
— 🧬 ТЗ	100.100.100.156
Service B	100.100.100.161
🖨 付 Green Mountain Site	
- # T4	100.100.100.102
- 🛷 T5	100.100.100.103
— 🧬 тб	100.100.100.129
Service G	100.100.100.105



Managing Sites and Nodes

Sites within Sites

A large *Site* can be broken down into smaller sub-*Sites*. In this way, there is a greater visual clarification of the electrical system architecture. As in the Clear Energy *Site*, we have two sub-*Sites* (wind farms) called Green Mountain and Blue Hill. The process is similar to Adding a Site on page 31, except you add the *Site* to an existing *Site* not to the Local Computer.

To add Sites within Sites:



1. From the main menu, right click **Clear Energy** (not Local Computer). Then select **Add Site(s)**

Properties Name	Blue Hill Site	
		Add Site(s) Cancel

2. Enter the *Site* Name (Blue Hill Site in our example), then click **Add Site.** In our example, we also add the Green Mountain Site.

The following window shows two new *Sub-Sites* Blue Hill and Green Mountain that are part of the Clear Energy Site.

Components		
E- Cocal Computer		
🖨 🗗 Cle	ar Energy	
	Blue Hill Site	
@	Green Mountain Site	

There are now two *Sites* within one large *Site*. Now it is possible to add *Nodes* to both the main *Site* (Clear Energy and the *Sub-Sites* Blue Hill and Green Mountain)

Adding Nodes

You can add *Nodes* to the main *Site* (Clear Energy) or to the sub-*Sites* (Blue Hill and Green Mountain. The process is the same as Adding a *Node* (please refer to Adding a New Node on page 37.)

To add Sub-Nodes under Sub-Sites:

• **Right click the** Blue Hill *Site* (**not local computer**), **then** add *Nodes* T1, T2, T3, and Service B.

You see below on the right the new Nodes created for Blue Hill Site.



In our example, we also created *Nodes* for the Clear Energy *Site* and the Green Mountain sub-*Site* for illustration purposes.

Components	Device IP
🖃 🐨 Local Computer	
🖮 🌆 Clear Energy	
- 🖅 155 KV	100.100.100.49
- 🗬 Blue Hill Wind Farm	100.100.100.65
🚽 Green Mountain Wind Farm	100.100.100.117
🖨 👍 Blue Hill Site	
	100.100.100.205
 T2	169.254.249.247
— 🧬 ТЗ	100.100.100.156
Service B	100.100.100.161
🖨 👍 Green Mountain Site	
 T4	100.100.100.102
	100.100.100.103
- # T6	100.100.100.129
Service G	100.100.100.105



In the screen above, it is clear to view the hierarchical structure of the Site with sub-Sites and Nodes built both under the main Site and the sub-Sites. The following section discusses how to move Sites and Nodes. Moving Nodes and Sites

The PQSCADA allows you to change the logical location of *Nodes* and *Sites* with drag and drop convenience, to parallel a physical change. It is possible to move entire *Sites* underneath other *Sites* as well as moving individual *Nodes* to other *Sites* as well as other *Nodes*.

🖃 🐨 🖥 🕞	Computer	
🖨 👍 Cle	ar Energy	
	155 KV	100.100.100.49
	Blue Hill Wind Farm	100.100.100.65
	Green Mountain Wind Farm	100.100.100.117
ė. P	Blue Hill Site	
-	d 11	100.100.100.205
	d T2	100.100.100.173
-	д ТЗ	100.100.100.156
	🧬 Service B	100.100.100.161
ė. P	Green Mountain Site	
	F 14	100.100.100.102
	4 T5	100.100.100.123
	е Т б	100.100.100.129
	🧬 Service G	100.100.100.105

In order to move Sites/Nodes, you must first unlock the components.

To unlock the components:

ag			
View View	Adminis	tration	
2	2	7	7
Refresh	Locked	Add Node	Delete Nod
Refresh			Component

• From the Administration Tool bar, click Locked.



This will unlock the Structure of the *Sites* and *Nodes* and allow you to change their position.

To Move Sites:

• To change the position, drag and drop the Green Mountain Site, then place it underneath the Blue Hill Site. then click Yes to continue.

Components	Device IP	Downloading	
🖃 🐨 Local Computer			
🖨 👜 Clear Energy			
- 🛷 155 KV	100.100.100.49	Disabled	Waiting for
- 🖝 Blue Hill Wind Farm	100.100.100.65	Disabled	Waiting for
🚽 Green Mountain Wind Farm	100.100.100.117	Disabled	Waiting for
🕂 👜 Blue Hill Site 🥤			23
- 📲 T1			
- 4 T2	You are about to move Green Mountain Site under Blue Hill Site. Are you sure you want to continue?		
🚽 ТЗ			
Service B			
🖨 👍 Green Mountain Site			
		Yes	
- 47 T5		165	
			No
	100.100.100.129	Disabled	Waiting for

The entire **Green Mountain Site** is now re-positioned with all attached *Nodes* underneath the **Blue Hill Site**.

Components	Device IP
Local Computer	
🖮 👍 Clear Energy	
🚽 🔐 Blue Hill Wind Farm	100.100.100.65
🚽 🥜 Green Mountain Wind Farm	100.100.100.117
🚽 🖅 155 KV	100.100.100.49
🖮 🖶 Blue Hill Site	
- 🛷 T1	100.100.100.205
— 🧬 Т2	100.100.100.173
— 🧬 ТЗ	100.100.100.156
- 👉 Service B	100.100.100.161
📥 👍 Green Mountain Site	
	100.100.100.102
- # T5	100.100.100.123
тб	100.100.100.129
🔤 🚛 Service G	100.100.100.105

You can also re-position *Nodes* to other *Sites* and to be placed under other *Nodes*.

To move Nodes:

• To change the position of a *Node* (T4 for example), drag and drop the *Node* to the new location (Blue Hill *Site*), then click Yes to continue.



Node T4 appears under the Blue Hill Site



It is also possible to move Nodes beneath other Nodes. In the example below we have repositioned Node T4 underneath Node T3.

Components	Device IP	Dow	
E Computer			Components
🖻 - 👩 Clear Energy			nputer
Blue Hill Wind Farm	100.100.100.65	Disabled	Energy
Green Mountain Wind Farm	100.100.100.117	Disabled	
	100.100.100.49	Disabled	ue Hill Wind Farm
🖻 👜 Blue Hill Site		83	reen Mountain Wind Farm
			55 KV
T3	You are about to move T4 u		ue Hill Site
Service B	Are you sure you want to co	ontinue?	T1
🖨 👍 Green Mountain Site			T2
- 🗬 T5			T3
— 🧬 Тб	Yes	No	
Service G	100.100.100.100	01000100	T 4
T4	100.100.100.102	Disabled	Service B
<u> </u>		<u> </u>	Green Mountain Site
			F T5
			🚽 Тб
			F Service G

Interoperability and Compatibility with Other SCADAs and Vendors



PQSCADA allows interfacing with other SCADA systems, through the automatic exporting of all its parameters in standard formats such as COMTRADE and PQDif. This feature may be easily implemented by using the *Tasks* feature.

For example, if the user requires to be notified (receive an event) every time a parameter exceeds its predefined limits, then a *Task* may be created in order to export any data relevant to that specific event in either COMTRADE or PQDif format. The data will be sent to a specific location where it will be intercepted by the user's SCADA and processed as any other information in the user's system. By implementing this feature, the user is able to harness all the power of the BLACKBOX system and benefit from its strengths and advantages while working with his legacy system.



This feature also allows the implementation of the BLACKBOX as a DFR (Digital Fault Recorder).

Should the user be interested in continuous data which the PQSCADA is logging in the PQZip compression format at a very high resolution, another task may be set up to periodically export this data in COMTRADE or PQDif format to a location that the user's SCADA can intercept and store or process.

The data export feature of PQSCADA is quite simple, as well as flexible, allowing exporting in lower resolutions of specific parameters (user selectable) in order to allow better management of storage capacity.

Exporting Data

Overview

A variety of simulation, measurement, and analysis tools for power quality engineers are now available from many vendors. Generally, the data created, measured, and analyzed by these tools are incompatible between vendors. Therefore, there is a need for a standard format which is universally compatible. Comtrade and PQDIf are universally acceptable file formats. We support exporting both of these standards in addition to our own proprietary PQZIP format. PQDIF and Comtrade files can be viewed with the standard viewers such as TOP or PQView, while PQZIP files are seamlessly parsed with the PQSCADA software for viewing with **Investigator**.



Users that own SCADA systems that are working with the Comtrade standard can incorporate Elpec's system by configuration of the scheduled tasks in the PQSCADA. Elspec's PQSCADA can be configured to regularly provide data for each of the many parameters it measures or calculates in Comtrade format files.

These files may be compiled event based or periodically for any predefined time span. By interfacing between the customer's SCADA and Elspec's PQSCADA, this information can be made available to the customer in the usually received, to be displayed, backed up or used in further processes.

The data is organized by the PQSCADA and stored in the SQL Database Server for quick access. A variety of electrical parameters and parameter statistics are calculated based on the raw PQZip data.

The processed data can be exported as a compressed PQZIP file. Also, the data can be exported as a **PQDIF** or **Comtrade** file format for viewing with generic viewer such as PQVIEW or TOP.

1

2



PQDif is a format that enables the user to store power quality data.

The data is usually sampled data (Waveforms) or sampled data that was processed (Parameters, RMS, or THD)

There is a difference when exporting Waveforms and Parameters. While Waveforms are treated as events other Parameters are treated as long-term data.

Data in PQDif is stored in observation records. Each observation is a set of graphs that correspond to a specific time period.

It is NOT possible to mix both Waveforms and Parameters in a single observation. A waveform observation must have a trigger attribute attached to it while other parameters observation shouldn't have any trigger attachment to it.

Tasks

Tasks are pre-defined functions that allow you to set regularly scheduled exports and/or reports according to a specified event or time trigger (monthly, daily, weekly, and fixed). A task operates within a *Site* or on components that are attached to a *Site*. Some tasks require the use of a template to define the specific parameters of the task. (See **Templates on page 72**) Each task can have multiple templates.

As with most PQSCADA components, you may access the *Tasks* through either the View or Administrative console. The default is View mode. You must first select **Tasks** in View Mode before switching to Administration mode in order to access the Task/Template components.



Adding a Task

To add a task:

1. Right click Tasks or select Add Task from the Administration tool bar.

The Select task window appears.



2. Choose Task type from the drop down menu.

In our example, we choose **COMTRADE**. There are three types of Task classifications based upon the file type

The header of each of the following screen captures reflects the Task type selected.

COMTRADE		
PQDIF		
POZIP		

- COMTRADE:
- PQDIF
- PQZIP
- 3. Enter a user defined **Task name.** (Test in our example)
- 4. Click **Next** when complete.

The Trigger selection window appears



The trigger selection window will not appear for PQZIP Tasks because they are exclusively schedule based.

	X
S COMTRADE Wizard	
Select the type of trigger for the task	
 Schedule based Event based 	
A scheduled based task is a task that is defined to be executed at a selected date and time (i.e. Fixed, Daily, Weekly etc.).	

- 5. Select either **Schedule based** or **Event based** trigger type, then click **Next** to continue (Schedule based in our example).
 - Schedule based: the task is launched according to a fixed or recurring time schedule.

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• Event based: the task is launched according to an occurrence of a specific event as defined by the template (see Templates on page 72)

The time schedule window appears only if you selected **Schedule based.** This allows you to set the effective schedule for the data according to Fixed, Daily, Weekly, or Monthly schedules as described.



If you select Event based, then the time based windows do not appear and you proceed directly to the next section.

Once the Trigger type is selected, it cannot be changed.

Fixed

The data schedule is set as a single (non-recurring) for a defined time range.

					X
😂 comtrae)E Wizard\Effective Sc	hedule			
Select the effe	ctive schedule for t	he data in the report:			
Recurrence Pati		ne data in the report.			
Fixed	Start date and time:	09/06/2009 00:00:00.000	-		
🔘 Daily	End date and time:	30/06/2009 00:00:00.000	-		
🔘 Weekly					
Monthly					

Daily

The data schedule is set as recurring for a defined time range every day.

👙 comtrai	DE Wizard\Effective Schedule
Select the effe Recurrence Pat Fixed Daily Weekly Monthly	terive schedule for the data in the report: tern Start time: 12:00 AM End time: 12:00 AM C

Weekly

The data schedule is set as recurring for a defined time range every week.

👙 comtrae	DE Wizard\Effective Schedule	
Select the effe Recurrence Pat Fixed Daily Weekly Monthly	ective schedule for the data in the report: Item Start day: Saturday Start time: 12:00 AM Constraints and time: 12:00 AM	

Monthly

C Fixed Daily Weekly	Start time: 12:00 AM C Select the first day of the month: 10
	A monthly schedule means that the task is executed every month after the wizard is closed and includes data starting from the given day and time in the month and up to 27 days afterwards.
	ge you need to define the effective schedule for the report's data. 'Effective Schedule' n nd end time of the data which the report will reflect.

The data schedule is set to begin on the defined day and run for up to 27 days following.

6. Select the desired data schedule for the report, then click **Next** to continue.

The Templates wizard appears.

ne COMTRADE Wizard\Templates	
Templates selection:	
V Template 1	New
☑ Template 3	

- 7. Select an existing Template(s) (Template 1 and Template 3 in our example) if one exists or select **New** to add a new template.
- 8. Click **Next** to continue adding a task.



Some tasks require the use of a template to define the specific parameters of the task. For example: A task that needs to record a voltage dip event, providing both the RMS Voltage and Frequency values during the event, the template is the place where the user defines the desired values

The templates window will not appear for PQZIP tasks; therefore you can proceed to Node Selection on page 67.If a new template is required; please continue with Adding a Template on page 72. Once a new template is added, you can resume at Node Selection on page 67.
Node Selection

The Node Selection window appears.

Task Wizard	83
net COMTRADE Wizard\Components	
Check the nodes that need to monitor the previously selected events	
Components	
Node 1	
PQS Node	
PQS Node	
PQS Node	
Hide unselected Refresh	
Back Next Cancel	

9. Select the desired *Node*(s), then click **Next**

By choosing multiple nodes, the task is performed on each of the selected nodes.

Task Wizard	
🤪 COMTRADE Wizard\Data	
Define the parameters for the COMTRADE report.	
COMTRADE filename prefix: Test	
	Dark Nut Count
	Back Next Cancel



Task Wizard X 🤪 🛛 PQDIF Wizard\Data Define the parameters for the PQDIF report

If a **PQDIF** file is to be exported, the following screen appears.



When exporting data to a PQDif file, the parameters exported depend on the parameters in the selected template and the user selection at the end of the PODif wizard.

- If <u>events only</u> is selected then graphs will be generated for all the events in the triggered duration. The graphs will contain <u>Waveforms</u> only. If the attached template has waveform graphs then these waveform graphs will be generated. If the template doesn't have any waveforms then all of the waveform graphs will be generated.
- If whole time period is selected, then the graphs will be generated for the relevant time period. The generated graphs will include graphs for all the template selected parameters except waveforms.
- If <u>whole time period and events</u> is selected, then graphs containing <u>waveforms only</u> will be generated for <u>all the events</u> (in the relevant time period) and graphs containing all the parameters in the template except waveforms will be generated for the whole time period.

PQDIF filename prefix test

Whole time period C Events only

Select the type of data in the report

Whole time period and Events

- 10. Enter a user defined filename prefix, then click Next.
- 11. The summary window appears with all of the task definitions.

Task Wizard	X
🤪 COMTRADE Wizard\Summary	
Below is a summary of the new task's definitions	
Task name: Test Task type: COMTRADE Task Trigger type: EventTriggered	
Selected components: 1. Node 1	
Selected templates: Template 1	
File name prefix: Test	
Ва	ck Finish Cancel

12. Click **Finish** to continue.

A successful task completion verification window appears.

[83
Task created su	accessfully!
	ОК

13. Click **OK** to complete.

This completes the **Adding a Task** process. The following screen appears showing the newly created **Task** called **Test** in the main viewing area. Also note the current status of the task displayed below.

Vie R	w Administr	ation			
Refresh Refresh	Nodes/Sites System	Tasks Views			
Co	omponents	Statu	Last Operation	Next Operation	Last
- 🔓 Local Cor					
📴 👍 Site-1					
	Test	Idle	On 7/30/2009 at 7:35 PM	Never	Succeeded
📥 🚺 Te	emplates				
	Template 1				

Deleting a Task



To delete a task:

1. From the main menu, right click the task or select **Delete task** from the Components area.

The confirmation window appears.



2. Click **Yes** to confirm.

Modifying a Task

The procedure to modify a task is similar to Adding a Task.

To modify a task

• From the main menu, double click the task or select Modify task by right clicking.

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💛 Viev	v Administr	ation		
R		1		
Refresh	Add Task Delete Task		Add Templat	e Delete Templat
Refresh	Tasks		Te	mplates
Components			Status	
⊡-¶g Local Com ⊡-¶an Site 1	al Computer			
i⊟⊶qej site i Ģ⊶gij Ta	sks			
	Test	Mo	dify task	Never
🖻 🎲 Te	mplates Template 1	Del	ete task	
	Template 2	Eve	ntlog	
-&	Template 3			
	Template 4			

Templates

Templates are used to define the Events, Parameters, and Configurations for utilization by different tasks. By using templates, you can save the time of redefining all variables across multiple tasks. A single template can serve multiple tasks.

Adding a Template

To add a template:



1. From the main window right click the Site name or select **Add Template** from the Administration view.



If you are adding a Template from the Task procedure, the following screen appears.

SecontRADE Wizard/Templates	83
Templates selection:	New

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The Template name window appears.

Template name: Template 1
A template is a term for a group of events, parameters and properties which are combined under a name.
A template is a part of a job's definition.
Back Next

2. Enter a user defined name for the template (Template1 in our example), then click **Next.**

The Template events window appears.



3. Select an event(s) from drop down list of **Available Events**, then click the middle cursor button to move the selection(s) to **Selected events**.

A new window appears with all selected events on the right side.

		X
💑 Template Wizard\Selected Eve	ents	
Available events		Selected events
🖶 - G4K System		B- Power
🖶 G4K User Defined		- PQ frequency out of range
Power		PQ high voltage variation
PQ overvoltage		···· PQ voltage dips
PQ voltage transient		PQ short voltage interruptions
PQ voltage unbalance	_	
PQ voltage harmonics		
PQ voltage inter harmonics		
PQ voltage flickering		
PQ Main Signalling		
PQ rapid voltage changes	_	
PQ long voltage interruptions		
- PQ General event 246		
- PQ General event 247		
PQ General event 248		
- PQ General event 249		
PQ General event 350		
PQ General event 251		
PQ General event 252		
PQ General event 253		
PQ General event 254	-	
		Back Next Cancel

4. Click Next to continue.

The Parameter selection window appears.

	Σ
💑 Template Wizard\Selected	Parameters
Available parameters	Selected parameters
⊕ R RMS	>>>
tHD THD	
Frequency	<<
🖶 🐨 Wave	
🖶 🕑 Active Power	
🖶 🖳 Reactive Power	
🖶 互 Apparent Power	
🖶 🕕 Power Factor	
🖶 🖅 Flickering	
🖶 🛄 Unbalance and Sequence	
🖶 🔝 Harmonic RMS	
🗄 🖽 Harmonic Percentage	
🗄 🖽 HRMS	

5. Select all **Desired Parameters** from the Available parameters list on the left, then click the middle cursor button to move the items to the **Selected parameters** on the right.

💑 Template Wizard\Selected Parameters	
Available parameters	Selected parameters
RMS V1 RMS V2 RMS V3	
RMS V12	
RMS V23	
RMS V31	
RMS VN	

The selected parameters appear in the Selected Parameters window.

ailable parameters		Selected parameters
BMS V23	>>	RMS V1 RMS V2 RMS V3 RMS V12
Ickering Unbalance and Sequence Harmonic RMS Harmonic Percentage HRMS		

6. Click **Next** to continue.

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The Property Definitions window appears. Here you will define the configuration parameters for all events.

Some of the parameters are changing rapidly in a given time unit while others change less often. Therefore we need to provide those parameters that change frequently with a higher resolution, hence the "High resolution" definition. The parameters which change less often in a given time unit may be represented with a lower resolution, hence the "Low resolution" parameter.

Which parameters will be represented in High Resolution and which in Low Resolution are preset in the PQSCADA manager.

Template Wizard\Property Definitions
High resolution: 6400 Samples/Second Calculator
High resolution is a term for short time intervals (i.e. seconds, milliseconds). It is generally used for waveforms.
Low resolution: 1.0 Samples/Second Calculator
Low resolution is a term for long time intervals (i.e. minutes, hours etc.).
Pre-trigger margin: 00:00:00.000 🗘 (HH:mm:ss.millisec)
A pre-trigger time span means that a defined time range is taken into account before the trigger's scheduled.
Post-trigger margin: 00:00:00.000 🛟 [HH:mm:ss.millisec]
A post-trigger time span means that a defined time range is taken into account after the trigger's scheduled.
Back Finish Cancel

- 7. Define all Property Definitions.
- High resolution: **Primarily used for short time intervals (waveforms). In our example we use 6400 which is calculated from 50Hz * 128 samples per cycle.**
- Low resolution: **Primarily used for longer time intervals (minutes, seconds). In our example we select** 1.0 update per second rate.
- Pre-Trigger margin: An additional time period (margin) is taken before the trigger is scheduled.
- Post-Trigger margin: An additional time period (margin) is taken after the trigger is scheduled.
- 8. Click **Finish** to complete the process.

The verification window appears.



9. Click **OK** to complete.

If you need to continue adding a task, please return to **Node Selection on** page 67.

Else, if you are adding a new template without adding a task, then you can see a new template called **Template 1** is created as shown in the window below.



Deleting a Template

To delete a template:

1. From the main menu, right click the template or select **Delete Template** from the Components area.



The confirmation window appears.

Are you sure you want to delete template?	83
Yes No	

2. Click **Yes** to confirm.

Modifying a Template

To modify a template:

• From the main menu, double click the Template or select Modify template by right clicking.

Viev	v Administratio	n							
R		51		đ	6		0	Ŷ	ς
Refresh	Add Task Delet	e Task	Add Template	Delete T	emplate	Start	Stop	Prefere	nces
Refresh	Tasks		Ten	nplates		PQS S	Service	Prefere	nces
Cor	nponents		Status			Last Op	eration		
- 🕎 Local Com	puter								
ie⊶feng Site 1 ie⊶íg⊌ Ta:	sks								
		Not run	ining		Never				Statu
🖮 🈡 Ter	mplates								
	Template 1	7							
	Template 2	Modify	/ template						
	Template 3	Delete	template						
	Template 4								

Locating Exported Data

The files are exported during the *task* process. For specific details on the different methods to export a file see **Tasks on page 61**

The procedure for locating exported data files from PQSCADA is common between all file types.

To locate the exported files:

1. From the main viewing area, right click the Task (Test in our example)



2. Click Task log.

The Event Viewer screen appears.

Ev	ent	Start Time		Description				
\oplus	2 - 14/0	7/2009 14:53:	58.843					
Ξ	1 - 08/0	7/2009 09:53:	55.256					
	Task	08/07/2009 0	9:5					
	File	08/07/2009 0	9:5	C:\ProgramData\PQS\PQSComp	onents\ELSSITE			
	Task	08/07/2009 0	9:5	Open folder				
				Copy to Clipboard				

3. Right click the folder to be exported, then select **Open folder**.

The Files appear in the window.

🖢 Organize 🔻 📗 Views				_	
avorite Links	Name	Date modified	Туре	Size	
Documents Pictures Music	PQZIP Test20090708_0 PQZIP Test20090708_0	7/8/2009 9:53 AM Open Restore previous ve	PQZIP File	1 KB 1 KB	
More » olders		Send To Cut	×	Compressed (zip Desktop (create Documents	
LSNODE_7d255adfbe70 ^ LSNODE_9aa885014334 LSNODE_4355fd741e6a		Copy Create Shortcut Delete		Mail Recipient Floppy Disk Driv	e (A:)
LSNODE_79769111993d LSNODE_a6fd8a76f0cb- LSNODE_ec000ddbe1d:		Properties			

The files are now ready for transferring to a different location or viewing in another application.

Viewing Data

The viewing of exported files is dependent on the file type.

- Comtrade files: Universally compatible file format can be viewed with PQview or TOP.
- PQDIF files: Universally compatible file that can be viewed with PQview.
- PQZIP files: Can be viewed with Elspec's proprietary Investigator application.

COMTRADE Files

(Common Format for Transient Data Exchange) is an important IEEE standard (C37.111) developed explicitly for the power industry. The standard defines a common format for data files used for the interchange of various types of fault, test or simulation data for electrical power systems. Although widely recognized, this file format is limited and does not allow for data compression.

The Comtrade file is exported from the Outgoing data folder of the PQSCADA. however it cannot be read by the PQSCADA software. Comtrade files can be viewed using different applications (**TOP** in our example)



PQDIF Files

Power Quality Data Interchange Format is a non-proprietary and flexible means of exchanging power quality data between different metering devices and software. Developed under the guidelines of IEEE P1159.3, PQDIF provides a common ground where different vendors can export to or import from, using a data format consistent with the defined PQDIF standard. Although widely recognized, this file format is limited.

Much like a Comtrade file, The PQDIF file is exported from the Outgoing data folder of the PQSCADA; however it cannot be read by the PQSCADA

software. PQDIF files can be viewed using different applications as in **TOP** or **PQVIEW** in our example.



PQZIP Files

PQZIP is a patented Elspec compression technology that enables continuous gap-less recording of all electrical parameter related data for significant time duration without the need of event thresholds of any kind. PQZip compression technology is based on the Lossy Compression Method which is protected under US Federal Patent Law as well as by patent laws in many other countries. Exporting the files in our own patented format allows for all data to be transferred in a compressed format. Exporting to PQZIP files allow for easy backup of large amounts of data or easy transfers (i.e. via emails) of data between users of different PQSCADA systems.

In order to view PQZIP files, the files need to be imported into a PQSCADA application.

Importing Data into PQSCADA

PQZip files are automatically downloaded from the BLACKBOX unit into the PQSCADA server. In addition, you may also manually retrieve the files and is often performed in the following common scenarios.

- Second Opinion: Sometimes analysis of PQZip files may be required at a secondary location for consulting purposes. In this case, the PQZip files are exported from the original PQSCADA and then transferred to a secondary location, into a PQSCADA server, to be further analyzed.
- Remote Site: At some remote sites, BLACKBOX units are installed without the PQSCADA server to download the PQZip files. In these cases, the PQZip files need to be extracted from the BLACBOX units into a portable media device and then imported into a PQSCADA server for analysis.



1

The PQZIP files are imported from an external source (the Outgoing Data Folder of the original PQSCADA, portable media device, or email) to the Incoming data folder of a virtual *Node* of the recipient (for more on virtual nodes see **Creating a Virtual Node on page 83**).



Downloaded PQZIP files can be loaded to a PQSCADA database just like a PQZIP file obtained from a BLACKBOX device, then viewed with the **Investigator** client software.

Creating a Virtual Node

In order to view PQZIP files in another PQSCADA application for further investigation and analysis by Investigator, it is necessary to create a virtual node in the PQSCADA Management Studio.

To create a virtual *node*:

• The process for creating a virtual node is similar to Adding a device node, except there is direct connection between the virtual node and the device. Therefore No IP selection is made. The purpose of this node is to create a logical location to store and parse data from a remote device. Refer to Adding a New Node on page 37.

		X
Add node		
This operation will create a	new node	
Database Engine		
Select database engine:	SQL Server SQL Express Insta	11
Server Name:	EN-SP1-64BIT\PQS	
Username:	sa	
Password:	******	
✓ Save Settings	Test	
Database		
New Database		
C Existing Database		
Test database connectio	m: No Device IP Required	
Properties		
Device IP:		
Name:	Virtual Node	
	Add Node(s) Canc	el

A virtual node is created with no directly attached device and No defined IP Address.

🖮 👜 Virtual Site		
🦾 🦪 Virtual Node	No IP defined	

Appendix A: SQL Server 2005 Management Studio Express



Overview

Microsoft® SQL Server Management Studio Express (SSMSE) is graphical configuration tool for managing SQL Server 2005 Express Edition. The following procedure provides a detailed procedure on how to install the SSMSE configuration tool and give specifics on using the tool to change the default password.

Installing SSMSE from the Microsoft® WebSite

To install SSMSE from the Microsoft® website:

1. Click on the link below

http://www.microsoft.com/downloads/details.aspx?FamilyId=C243A5A E-4BD1-4E3D-94B8-5A0F62BF7796&displaylang=en

The Microsoft® SQL Server Management Studio window appears:

😔 😔 🗢 📶 http://www	microsoft.com/downloads/details.aspx?Family	Id=C243A5AE-4BD1-4E3D-94B8	-5A0F62BF7796&displaylang=en	• 😽 🗙
File Edit View Favorites	Tools Help			
🚖 🕸 📶 Download de	tails: Microsoft SQL Server Manage			🙆 • 🕅
Click Here to Install Silveright				United States
Microsoft	Ĩ		🔎 Web 🖉 Live Search	
Download Center				
Download Center Home	Search All Downloads		Go Advanced Search	
Product Families Windows Office Servers Business Solutions	Microsoft SQL Serve Brief Description	-		20 SALARSE ING SUMBLINES
Developer Tools Windows Live MSN	Microsoft SQL Server Management S Express Edition and SQL Server 2009 On This Page	tudio Express (SSMSE) is a fr 5 Express Edition with Advanc	ee, easy-to-use graphical management tool for manag ed Servi <mark>ce</mark> s.	ing SQL Server 2005
Games & Xbox Windows Mobile All Downloads	Ouick Details Svstem Requirements Additional Information	↓ <u>Overview</u> ↓ <u>Instructions</u> ↓ <u>Related Resources</u>		
Download Categories	What Others Are Downloading	Related Downloads		

2. Scroll down, then click **Download** for the appropriate file

File Name:	File Size	
SQLServer2005 SSMSEE.msi	38.5 MB	Downloa



The File Download Security Warning appears:



3. Click **Save** (We recommend saving the download file to the desktop)

Save As					×
🖉 🗢 💻 Desktop 🕨			• 4	Search	م
🍓 Organize 👻 📰 View	s 🔻 📑 Nev	/ Folder			0
Favorite Links	Name	Size	Туре	Date modified	<u>^</u>
📃 Desktop	D OA	sp2			
🗐 Recent Places	- W - ~				=
👰 Computer		blic			
Documents	Pu 📕	BIIC			
Pictures Music More w	c.	mputer			
Folders 🔺	Ne	twork			-
File name: SQL	Server2005_SSN	ISEE			•
Save as type: Wind	dows Installer P	ackage			•
) Hide Folders				Save	Cancel

The downloading dialog box appears:



4. After downloading is complete, double click the **SQLServer2005_SSMSee.msi** file



SQLServer2005_SSMSEE.msi Windows Installer Package 39,418 KB

The Security Warning appears.



5. Click **Run** to commence the installation procedure.



6. Click Next to continue.

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😸 Microsoft SQL Server Management Studio Express Setup 🗧	х
License Agreement	
Please read the following license agreement carefully.	
MICROSOFT SOFTWARE LICENSE TERMS	•
MICROSOFT SQL SERVER 2005 MANAGEMENT STUDIO EXPRESS	
These license terms are an agreement between Microsoft Corporation (or based on where you live, one of its affiliates) and you. Please read them. They apply to the software named above, which includes the media on which you received it, if any. The terms also apply to any Microsoft	Ŧ
 I accept the terms in the license agreement I do not accept the terms in the license agreement 	
< Back Next > Cancel	

7. Select **I accept**, then click **Next** to continue.

😸 Microsoft SQL Server Management Studio Express Setup	×
Registration Information The following information will personalize your installation.	4
Enter your name and the name of your organization in the fields below.	
Name:	
John Smith	
Company:	
Elspec	
< Back Next > Cano	:el

8. Enter Name and Company, then click Next.

🗒 Microsoft SQL Server Management Studio Express Setu	ар 💽
Feature Selection Select the program features you want installed.	
Click an icon in the following list to change how a feature is	s installed.
Management Studio Express	Feature description Installs interactive management tools for running SQL Server, including SQL Server Management Studio Express.
Installation path	
C:\Program Files\Microsoft SQL Server\	
	Disk Cost
< Back N	lext > Cancel

9. Accept the default features, then click Next.



10. Click Install.

11. The status window appears.

😸 Microsof	t SQL Server M	anagement Studio Ex	press Setup	X
-	Installing Microsoft SQL Server Management Studio Express The program features you selected are being installed.			
E		ile the Install Wizard in: Itudio Express, This ma	stalls Microsoft SQL Server y take several minutes.	
j闄 Microsof	t SQL Server M	anagement Studio Ex Completing t	oress Setup he Microsoft SQL Se	erver
		Managemen Setup has install	ed Microsoft SQL Server M ed Microsoft SQL Server M fully, Click Finish to exit.	up
		< <u>B</u> ack	Finish	Cancel

12. Click **Finish** to complete.

Security

The default database SQL server comes with default user name **sa** (**system administrator**). The following pages describe how to change the password both in the SSMSE configuration tool as well as the system database.

To change the password in SSMSE:

1. From the main window, select Microsoft SQL Server 2005.



The main menu opens with the **Connect to Server** window. Use the default login name default **sa** for system administrator.

SQL Serv	ver.2005	Windows Server System
Server type:	Database Engine	*
<u>S</u> erver name:	PQS-SQL\ELSPEC	: v)
Authentication:	SQL Server Auther	ntication 👻
Login:	sa	•
Password:	**********]
	🔲 Re <u>m</u> ember pa	browsee

2. Login with current Password, then click Connect. (PQSpqs12345)



The Main SQL Server Management Studio Express window appears.

- 3. In the left menu bar, select **Security** \rightarrow **Logins** \rightarrow **sa**.
- 4. Double click sa.

The Login Properties window appears.

Select a page	Por Burn	
🚰 General	🖳 Script 🔻 🚺 Help	
I Server Roles I User Mapping I Status	Login <u>n</u> ame:	Sgarch
	SQL Server authentication Password:	
	Confirm password:	
Connection	Enforce password policy Enforce password expiration User must change password Mapped to certificate Cetificate name: Mapped to asymmetric key	at next login
Server:	Key name:	
EN-XP-SP3-2\PQS		<u></u>
Connection:	Default <u>d</u> atabase:	master 💌
sa	Default language:	English 💌
View connection properties		
Progress		
Ready		
		OK Cancel

- 5. Enter the new Passord, then confirm.
- 6. Click **OK** to complete.



To change password in the database server:

7. Navigate to the PQS Components folder.



8. Right click PQSComponents.xml



- 9. Select Edit.
- 10. The Source code appears in an editable format in Notepad.



11. Change the password for both the *Node* and the *Site*.



Please be very careful when updating this file. Making a mistake can damage the PQSCADA. 12. When complete, select **File→Save As**

File	Edit	Format	View	Help
	New		Ctrl	+N
	Open.		Ctrl	+0
	Save		Ctr	I+S
	Save A	4s		
	Page	Setup		
	Print		Ctr	+P
	Exit			

13. Save under the same file name.



14. Select Yes to overwrite the existing file.





Appendix B: SQL Express Install

his operation will create a new	w site		
Database Engine		ſ	
Select database engine:	SQL Server	Ŧ	SQL Express Install
Server Name:			
Usemame:			
Password:			Test
Save Settings			
Database			
New Database			
🔿 Existing Database			
Test database connection:			Test
Properties			

1. From the Add Site menu, click SQL Express Install.

The SQL Express Installation window appears.

-	C ×
SQL Express Instal	lation
	tallation file of SQL Express. When you're or 'Cancel' to abort this operation.
	Browse
1	

- 2. Click the browser button.
- 3. Navigate to the source file.



The file selection is dependent on your Operating System. SQLEXPR_x64 for a 64 bit O.S. or SQLEXPR_86 for a 32 bit O.S.



4. Double click the correct SQL Express file.

The SQL Express Installation window appears.

SQL Express Installation Click "" and locate the installation file of SQL Express. When you're done click 'Install' to install or 'Cancel' to abort this operation.
SQL Server\SQL Express 2005\SQL
Install Cancel

5. Click **Install** to complete.



		х
Add site		
This operation will create a new	v site	
Database Engine		
Select database engine:	SQL Server SQL Server Install	
Server Name:		1
Usemame:		
Password:	Test	
Save Settings		
Database		
New Database		
Existing Database		
Test database connection:	Test	
Properties		
Name		
	Add Site(s) Cancel	

When complete, the Add Site dialog box appears.

6. Click the **Browser** button next to the Server name.

The browser button allows you to search for an available database server The Select Database Server window appears.

Select Database Server	
Local Servers Network Servers	
Server Name	<u>م</u> ۲ م
SQLSERVER\PQS	
TESTXP	=

7. Select Local Servers tab.

This opens open a table with the database list.

- 8. Double click the database that ends with **PQS**.
- 9. The Add Site window reappears.

PQSCADA USER MANUAL VERSION 3.2 December 2009

		X
Add site		
This operation will create a new	v site	
Database Engine		
Select database engine:	SQL Server	SQL Express Install
Server Name:	SQLSERVER\PQS	
Usemame:	sa	
Password:		Test
✓ Save Settings		
Database		
New Database		
Existing Database		
Test database connection:		Test
Properties		
Name		
	Add S	ite(s) Cancel

- 10. Enter user name: sa
- 11. Enter password: PQSpqs12345
- 12. Select New Database in the database section.
- 13. Assign a name for the *Site* (may be changed at a later date).
- 14. Click Add Site(s).

The Add Site window appears when complete.



15. Resume at Step 3: Adding a New Node on page 20.



The default user name (sa) and password (PQSpqs12345) for the SQL Express database.

We recommend clicking Test to verify the connection.

We also recommend that you save your settings

Appendix C: Installing Pre-requisites

If you do not currently have these programs, they can be found on the PQSCADA Installation disk or on the Web.

Installing MSI Installer

To install MSI Installer from the PQSCADA Installation disk:

1. Navigate to the files on the CD.



2. Double click the **Tools** folder.

The Tools window appears.



3. Double click the MSI Installer Folder.

The MSI Installer window appears.



4. Double click the folder that corresponds with your Operating System.

A window appears with available install files.



- 5. Double click the appropriate file to begin the installation process.
- 6. Follow the installer instructions to complete the installation.



In most cases, it is preferable to access the software from the PQSCADA disk because of the size of the download file.

To install MSI Installer from the Web:

1. Navigate to the Microsoft web*site* at: <u>http://www.microsoft.com/downloads/details.aspx?familyid=5A58B56F-60B6-4412-95B9-54D056D6F9F4&displaylang=en</u>

The MSI download page appears.

Click Here to Install Silverlight	United	States
Microsoft	Search Microsoft.com	
Download Center		
Download Center Home	Search All Downloads Go Advanced Se	earch
Product Families Windows Office Servers Business Solutions Developer Tools Windows Live MSN Games & Xbox Windows Mobile All Downloads	Windows Installer 4.5 Redistributable Brief Description The Microsoft® Windows® Installer (MSI) is the application installation and configuration se Windows. These download packages will update the version of Windows Installer on your sy version 4.5. On This Page Quick Details System Requirements Instructions Related Resources What Others Are Downloading 	rvice fo
Download Categories Games DirectX Internet Windows Security & Updates Windows Media		
Drivers Home & Office Mobile Devices Mac & Other Platforms	Version: 4.5 Date Published: 6/2/2008 Language: English	
System Tools Development Resources	Download Size: 2 KB - 43.3 MB* *Download size depends on selected download components.	

2. Download and complete the installation from the website.

Installing .NET Framework 3.5sp1

To install .NET Framework 3.5sp1 from the PQSCADA Installation disk:

1. Navigate to the dotnetx3.5.exe file.



- 2. Double click dotnetfx35.exe.
- 3. Follow the installer instructions.

To install .NET Framework 3.5sp1 from the Web:

1. Navigate to the Microsoft web*site* at: <u>http://msdn.microsoft.com/en-us/netframework/aa569263.aspx</u>

The msdn download Site appears.

	rnet Experience					United States -
msdn			G LANSDAL			
THIS CHI			Search MSDN wit	n Bing		Web
.NET Framev	vork Develope	er Center				
Home	Library	Learn	Downloads	Support	Community	Forums
			.NET Framework Dow			
Latest Versio	on					
.NET Frai	nework 3.	5 Service	Pack 1			
The .NET Frame	work 3.5 Servio	e Pack 1 (SP1)	delivers:			
				ons a€" without ha	wing to change any o	ode
Performance	e increases betwe	een 20-45% for	delivers: r WPF-based applicati ore control over the v			
 Performance WCF improv 	e increases betwe	een 20-45% for developers mo	r WPF-based applicati ore control over the v			
 Performance WCF improvinstallation e Improvement 	e increases betwe ements that give experience for cli	een 20-45% for developers mo ent applications data platform,	r WPF-based applicati ore control over the v s such as the ADO.NE ⁻	vay they access d	ata and services Stre	eamlined
 Performance WCF improvinstallation e Improvementsupport for \$ 	e increases betwee ements that give experience for clints in the area of SQL Server 2008	een 20-45% for e developers mo ent applications data platform, la€™s new featu	r WPF-based applicati ore control over the v s such as the ADO.NE ⁻	vay they access d I Entity Framewor	ata and services Stre	eamlined

- 2. Select Install it now.
- 3. Follow the installer instructions.

Appendix D: Upgrading from 3.0

The following procedure applies to upgrade installations of PQSCADA Version 3.0 or earlier. If you have a version 3.1.1.10 or 3.1.1.45, then please refer to the installation procedure on **Installing the PQSCADA Software on page 7**.



Warning: If you have not backed up your database yet, then you need to do so before proceeding. Refer to Appendix E: Backup the Database on page 107.

Stopping Activator Service

The first step before upgrading the PQSCADA is to stop the Activator Service

To stop Activator Service:



1. Start PQSCADA by double clicking the **PQSCADA desktop icon** Managem...

The PQSCADA Management window appears.



- 2. Click Stop Activator Service.
- 3. A New PQSCADA Management window appears.



4. Close PQSCADA.

Disabling IIS Service

It is necessary to disable IIS so that it does not interfere with the installation. if you need to use the IIS service for another application on your PC, the other applications would have to be terminated before commencing the installation.



Warning: If you have not backed up your database yet, then you need to do so before proceeding Refer to Appendix E: Backup the Database on page 107.

To disable the IIS service:

1. On your desktop, click Start.

A start menu appears.



2. Right click My Computer, then select Manage.

The Computer Management window appears.



3. Select Services and Applications \rightarrow Services.

The Services Window appears.

Services					
IIS Admin	Name 🔺	Description	Status	Startup Type	Log On As
	🍓 Human Interface D	Enables ge		Disabled	Local System
Stop the service	IIS Admin	Allows adm	Started	Automatic	Local System
Pause the service	🆏 Image Converter vi			Manual	Local System
Restart the service	🍇 IMAPI CD-Burning C	Manages C		Manual	Local Systen
	🍓 Indexing Service	Indexes co		Manual	Local System
	🏶 InstallDriver Table	Provides s		Manual	Local System
Description:	🏶 Intel(R) PROSet/Wi	Manages t	Started	Automatic	Local System
Allows administration of Web and	🏶 Intel(R) PROSet/Wi	Intel(R) PR	Started	Automatic	Local System
FTP services through the Internet	🍓 Intel(R) PROSet/Wi	Wireless M	Started	Automatic	Local Syster
Information Services snap-in	🍓 IPSEC Services	Manages I	Started	Automatic	Local Syster

4. Right click **IIS Admin**.

Stop Pause
Resume Restart
All Tasks 🔹 🕨
Refresh
Properties
Help

5. Select Properties.

IIS Admin Prope	rties (Local Computer)
General Log On	Recovery Dependencies
Service name:	IISADMIN
Display <u>n</u> ame:	IIS Admin
Description:	Allows administration of Web and FTP services through the Internet Information Services snap-in
Pat <u>h</u> to executabl C:\WINDOWS\s	ie: ystem32\inetsrv\inetinfo.exe
Startup typ <u>e</u> :	Disabled Automatic Manual
Service status:	Disabled stated
<u>S</u> tart	Stop Pause Resume
You can specify t from here.	he start parameters that apply when you start the service
Start para <u>m</u> eters:	
	OK Cancel <u>Apply</u>

- 6. Change **Startup Type** to **Disabled**.
- 7. Change Service status to Stop.
- 8. Click **OK** to finish.



If you need to restore your original system, then Restart IIS as below.

To Restart IIS:

a) Perform steps 1-5 from **Disabling IIS Service on page 103**.

IIS Admin Proper	ties (Local Computer)
General Log On	Recovery Dependencies
Service name:	IISADMIN
Display name:	IIS Admin
Description:	Allows administration of Web and FTP services through the Internet Information Services snap-in
Path to executable	e:
C:\WINDOWS\sy	stem32\inetsrv\inetinfo.exe
Startup type:	Manual Automatic
Service status:	Manual Disabled Stopped
Start	Stop Pause Resume
You can specify th from here.	ne start parameters that apply when you start the service
Start parameters:	
	OK Cancel Apply

The IIS Admin Properties window appears.

- b) Change **Start Up** type to **Manu**al.
- c) Select Apply.
- d) Change Service status to Start.
- e) Click **OK** to finish.

Appendix E: Backup the Database

The following procedure applies to upgrade installations of PQSCADA Version 3.0 or earlier.

To backup the database:

1. Right click the *Node*, then select **Backup Database** or select **Backup Database** under Actions.



The Welcome screen appears.



2. Click Next to continue.

The Backup target folder appears.

Backup target folder Select target folder for the backup file			
Backup folder path:			
C:\elspec\3.0.4.0\Data\Database			
		Browse]

- 3. Select the desired backup folder
- 4. Click **Next** to complete the backup process.



Please do not back to the root directory C:\, Program Files, My Documents, or the Desktop. We recommend creating a new backup folder.

Appendix F: Starting/Stopping PQS through Windows

The PQSCADA installation procedure allows you to install both the **PQSCADA Management Studio** and the **PQSCADA Server** (PQS service). In order to stop and/or start the PQS service, you need to use the PQSCADA Management Studio or by accessing the **Services** through windows configuration. In this section there is a detailed explanation on how to access and use the **PQS Server** through MS Windows Vista TM.

費 PQSCADA
Select PQSCADA Components
Select components to be installed
PQSCADA Server
PQSCADA Management

To start/stop PQS through Windows:

1. Right click the bottom system tray.

The Toolbar window appears.



- 2. Click Task Manager.
- 3. The Task Manager window appears.

plications Pro	icesses	Services	Perfo	rmance N	etworking Use	rs
Name	PID	Descript	ion	Status	Group	1
SamSs	640	Security	Ac	Runn		Ξ
ProtectedSt		Protecte	ed	Stop		
NetTcpPort		Net.Tcp	Po	Stop		
Netlogon		Netlogo	n	Stop		
KeyIso		CNG Ke	/ Is	Stop		
idsvc		Window	s C	Stop		
PlugPlay	804	Plug and	l Play	Runn	DcomLaunch	
DcomLaunch	804	DCOM S	er	Runn	DcomLaunch	
WinHttpAut		WinHTT	Ρ	Stop	LocalService	
WebClient	528	WebClie	nt	Runn	LocalService	
WCRCSVC	528	Window	s C	Runn	LocalService	
W32Time	528	Window	s Ti	Runn	LocalService	
upnphost		UPnP De	evic	Stop	LocalService	
THREADOR		Thread	0r	Stop	LocalService	
TBS		TPM Bas	;e	Stop	LocalService	-
					Services.	

- 4. Under the Service tab, Click Services.
- 5. The Services window appears.

File Action View	Help					
⊨ → 🗔 🖸 (🗟 📑 🛛 📰 📄 🔲 🖬	Þ				
🚴 Services (Local)	Services (Local)					
	PQS Server	Name	Description	Status	Startup Type	Log On As
		🔍 Peer Name Resolu	. Enables Ser		Manual	Local Service
	Stop the service Pause the service	🔍 Peer Networking	Provides Pe		Manual	Local Service
	Restart the service	🧠 Peer Networking I	Provides Ide		Manual	Local Service
		🔍 Performance Cou	Enables rem		Manual	Local Service
	Description:	🔍 Performance Logs	. Performanc		Manual	Local Service
	POS Server	🔍 Plug and Play	Enables a c	Started	Automatic	Local Syste
		🧠 PnP-X IP Bus Enu	The PnP-X		Manual	Local Syste
		🤐 PNRP Machine Na			Manual	Local Service
		Rortable Device E		Started	Automatic	Local Syste
		PQS Server	Start	Charles d	Automatic	Local Syste
		🔍 Print Spooler		d	Automatic	Local Syste
		🔍 Problem Repo	Stop		Manual	Local Syste
		Rogram Com	Pause	d	Automatic	Local Syste
		C Protected Stor	Resume		Manual	Local Syste
		Quality Windo	Restart		Manual	Local Service
		🤐 ReadyBoost 🤐 Remote Acces	All Tasks	۵ ۱	Automatic Manual	Local Syste
		Remote Acces	AITON	, d	Manual Manual	Local Syste Local Syste
		Remote Proces	Refresh	d	Automatic	Network S
		Remote Proces	Properties	a	Automatic Manual	Network S
			Properties		ivialiudi	Network S
		•	Help			- F

- 6. Select PQS Server.
- 7. Select the desired function. (**Stop, Pause, or Restart**), from the window on the left or by right clicking the PQS Server.